# Quandong Pan

(He/Him)

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## “EMBRACE COMPLEXITY”

- “There is no flood in a single raindrop, no financial crash in a single dollar, and no love in a single carbon atom. Yet, when combined under certain conditions, these simple elements create phenomena far greater and more complex than their individual parts.” — The Science of Complexity

## RESEARCH INTERESTS:

- I am driven to understand the **fundamental principles underlying biological processes** like pattern formation, regeneration and multicellularity etc, through employing **experimental and computational techniques**, including scRNA-seq, multi-omics integration, modeling the intricate dynamics of gene regulatory networks and the epigenetic landscape, ultimately seeking to control these systems through the combined power of **systems biology and bioengineering**.

## FIELDS OF INTEREST IN GENERAL:

- Systems Biology
- Synthetic Biology & Biotechnology
- Metabolic & Genetic Engineering
- Directed Evolution and Optimization of Microorganisms
- Evolutionary Developmental Biology
- Regeneration and Morphogenesis
- Organoids, Biofilms and Multicellularity
- Self-Organization and Emergence
- Multiscale Analysis of Cellular Systems
- Network Science and Complex Systems Modeling
- Attractor Landscape Analysis of GRNs

# EDUCATION

**Bachelor of Science – Major: Life Sciences**

University of Freiburg

Oct 2022 — Present

https://uni-freiburg.de/ucf/las/curriculum/#life-sciences

# RELEVANT COURSEWORK

- Cell Biology
- Basic Chemistry and Biochemistry
- Genetics and Epigenetics
- Data Science with R
- Computational Genomics
- Human Cognition and Artificial Intelligence
- Engineering with Living Materials

# RESEARCH EXPERIENCE

### Research Internship — The Bonasio Lab

**University Hospital Freiburg**

https://www.bonasiolab.org/#top

[ 03/04/2024 – 30/04/2024 ]

The lab focuses on the molecular mechanisms of epigenetic memory, particularly interested in elucidating the epigenetic mechanisms of caste transition and reversion in Harpegnathos saltator ant:

### Research Internship — Molecular Biology of Archaea

**University of Freiburg**

https://www.archaellum.org/research

[ Sep 2025-Present ]

- The lab focuses on understanding the biogenesis of the archaeal cell envelope including processes like N-glycosylation, the assembly of macromolecular structures like pili and the archaellum, and celldivision and regulatory processes depending on protein phosphorylation.

- I am trained on but not limited to cloning, sulfoobus genetics, phenotypical analysis, microscopy, motility assays, nucleotides isolation, biochemistry, overexpression in E. coli, protein purification etc.

# CONFERENCES

- Horizons in Molecular Biology Symposium 2025 in Göttingen
    - [ 08/09/2025 – 11/09/2025 ] Max Planck Institute for Multidisciplinary Sciences
    - Biochemistry and Molecular Biology, Cell Biology
    - Genome Biology, Developmental Biology
    - Structural Biology, Molecular Neuroscience, Computational Biology
    - Link: **https://www.mpinat.mpg.de/horizons**
- Life Sciences Annual Meeting 2024 in Switzerland
    - [ 13/02/2024 – 15/02/2024 ] University of Lausanne
    - Bioinformatics, Biophysics, Cardiovascular Biology & Physiology
    - Experimental Pharmacology, Ion Channels and Membrane Transporters Microscopy
    - Molecular and Cellular Biosciences, Proteomics and Systems Biology
    - Link: **https://annual-meeting.ls2.ch/2024/program**
- SY-Stem Cell Conference 2024 in Vienna
    - [ 13/03/2024 – 15/03/2024 ] Vienna BioCenter, Austria
    - Early Embryogenesis
    - Neural lineage specification
    - Nervous Systems Development
    - Brain Disease, Regeneration and Novel Technologies
    - Link: **https://www.oeaw.ac.at/imba/seminars-events/past-events/sy-stem-2024**
- Interdisciplinary College 2024 of Complex Systems in Germany:
    - [ 01/03/2024 – 08/03/2024 ]
    - Computational Neuroscience, Machine Learning, Game theory
    - Theoretical Biology and Complex Dynamical Systems Simulation
    - Link: **https://interdisciplinary-college.org/program/**

# SKILLS

- Programming Language:
    - R Language
    - MATLAB and Python
- Software and Platform: R Studio, MATLAB, Github, NetLogo
- Basic Skills in Molecular and Experimental Biology

# LANGUAGE PROFICIENCY

- Chinese (Native)
- English
    - IELTs (Scale of 9)
        - (Overall 7.0, Listening 7.0, Reading 7.5, Speaking, 7.5, Writing 6.5)

    - PTE Academic (Scale of 90)
        - (Overall 86, Listening 80, Reading 90, Speaking, 72, Writing 90)

- German B2